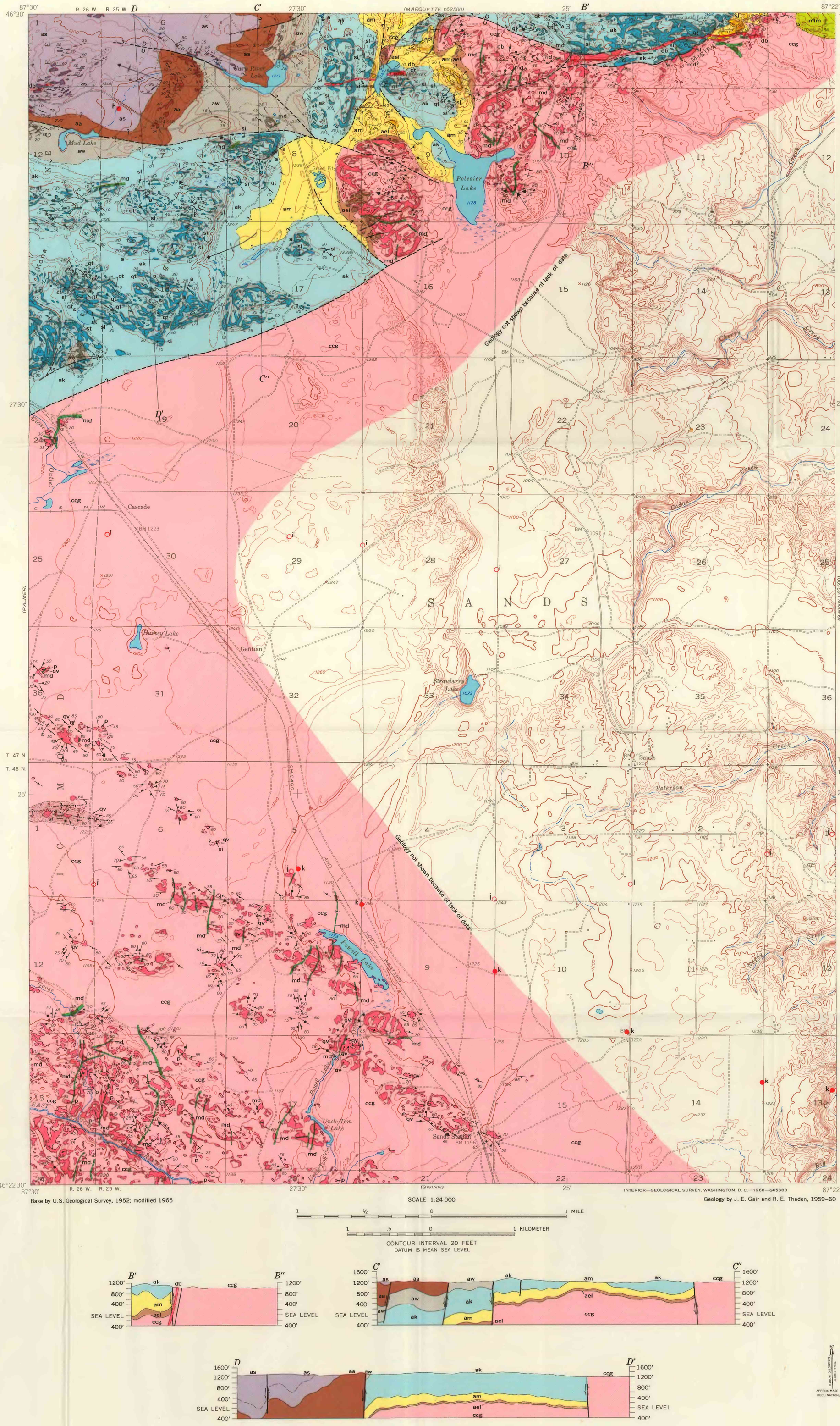
UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PROFESSIONAL PAPER 397
PLATE 2



Base by U.S. Geological Survey, 1952; modified 1965

SCALE 1:24 000

1 MILE
1 KILOMETER

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

APPROXIMATE MEAN DECLINATION, 1968

Geology by J. E. Gair and R. E. Thaden, 1959–60

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1968—G65388

GEOLOGIC MAP AND SECTIONS OF THE SANDS QUADRANGLE MARQUETTE COUNTY, MICHIGAN

EXPLANATION

Exposed areas shown by darker shade

PRECAMBRIAN

Keweenawan Series

db — Diabase

Mainly massive dark-gray medium-grained dike rock having pronounced diabase texture. Black to dark reddish brown on weathered surfaces. Rock commonly is inversely magnetized and causes negative magnetic anomalies

Age uncertain

md — Metadiabase and metagabbro

Green to dark-green generally medium- to coarse-grained rock. Form dikes and irregular-shaped bodies. Many thin dikes in Compeau Creek Gneiss are fine grained. Locally the coarse-grained metadiabase or metagabbro is green and white from the intergrowth of hornblende and feldspar. Queried metadiabase in SW¼ sec. 2, T. 47 N., R. 25 W., may be highly altered diabase of Keweenawan age

Menominee Group

as — Siamo Slate

Laminated and nonlaminated dark-gray quartzose, sericitic or sericitic-chloritic slate, and dark-gray generally thin interbedded quartzite. Slate commonly weathers to ferruginous material having rusty-brown colors

aa — Ajibik Quartzite

Vitreous medium-grained thin- to thick-bedded quartzite and some thin interbeds of sericitic or sericitic-chloritic slate and quartzitic siltite. Weathers light gray, pink, pale reddish brown, or tan. Locally has reddish-brown or yellowish-brown ferruginous spots, ¼–½ inch in diameter. Matrix contains minor amounts of sericite and hematite. Thin bed of conglomerate at base of formation in SE¼ sec. 6, T. 47 N., R. 25 W. Maximum thickness 650 feet

UNCONFORMITY

Animikie Series

aw — Wewe Slate

Gray and greenish-gray laminated and massive (nonlaminated) sericite-chlorite-quartz slate. Locally chloritic material is in granules, and in a few places there are vague textures suggestive of volcanic and pyroclastic materials. Slate in a few places is rich in leucozene and(or) rutile. Some of the slate weathers to yellow-brown or rusty ferruginous rock. Maximum thickness 900 feet

Chocolay Group

sl, qt, si, ak, qv, a, st — Kona Dolomite

Mainly tan, salmon, pinkish- or pale-gray fine- and medium-grained massive dolomite or thinly laminated chert and dolomite. Dolomite layers commonly contain scattered detrital quartz. Maroon, gray, and green sericitic slate in lower part of formation. Maximum thickness 1,000–1,200 feet

sl, *slate in thin layers*
qt, *red quartzite and dolomitic quartzite in thin layers; locally crossbedded*
st, *orange and brown laminated siltite in thin layers*
a, *algal structures common in places*
si, *silicified locally*
qv, *thick quartz vein, near E¼ cor., sec. 13, T. 47 N., R. 26 W.*

am — Mesnard Quartzite

Vitreous medium-grained thin- to thick-bedded quartzite. Weathers white to light pink. Locally brecciated; secondary hematite cements breccia fragments. Locally crossbedded. Maximum thickness 500–700 feet

ael — Enchantment Lake Formation

Conglomerate, arkose, sericitic slate, quartz wacke, sericitic quartzite, and quartzite. All lithologies not found in any one part of the section. Maximum thickness 500 feet

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p, qv, ccg, si — Compeau Creek Gneiss

Foliated light-colored tonalite and granodiorite, and small amounts of monzonite, quartz monzonite, and granite. Mainly pink or salmon. Faint streaky layering in many places. Widespread but small amounts of amphibolite and well-layered amphibolite gneiss. Locally amphibolite or tonalite rich in hornblende or biotite is abundant. Exceedingly rich in quartz in places close to south margin of synclinorium Thickness unknown

si, *locally silicified, shown by stippled pattern*
p, *pegmatite*
qv, *quartz veins*

mlm — Mona Schist

Projected into Sands quadrangle from Marquette quadrangle. Not exposed in Sands quadrangle

Limit of outcrop or outcrop area

Varieties of rock too small within exposure to show at map scale indicated by dot at point of observation; letter indicates type of rock

Contact

Long dashed where approximately located; short dashed where inferred; queried where doubtful

Fault, approximately located

Short dashed where inferred; queried where doubtful; dotted and queried where hypothetical. U, upthrown side; D, downthrown side

Anticline

Showing approximate trace of axial plane and direction of plunge of axis

Syncline

Showing approximate trace of axial plane and direction of plunge of axis

Plunge of fold axis

Strike and dip of beds

Includes strike and dip of layers in gneiss, and some possibly overturned beds

Strike of vertical layers in gneiss

Horizontal beds

Top direction shown by crossbedding

Strike and dip of foliation in lower Precambrian rocks and of cleavage in middle Precambrian rocks

Strike of vertical foliation in lower Precambrian rocks and of vertical cleavage in middle Precambrian rocks

Strike and dip of vein or dike

Bearing and plunge of lineation

Strike and dip of foliation plunge of lineation

Strike of vertical foliation showing plunge of lineation

Strike and dip of foliation and double lineation

Strike and dip of joints

Strike of vertical joints

Note: Structure symbols not within limits of outcrop refer to nearest outcrop

Test pit

Shallow exploration shafts in sec. 2, T. 47 N., R. 25 W.

Quarry

Abandoned quarry

k — Crest of positive aeromagnetic anomaly. Letter refers to anomaly in profiles on plate 7

i — Crest of negative aeromagnetic anomaly. Letter refers to anomaly in profiles on plate 7